Back from the Brink: How a Service National Fish Hatchery Supplementation Program Helped Rebuild A Declining Salmon Run

By Dan Magneson, Assistant Hatchery Manager
Quilcene National Fish Hatchery

Looking at the graph, I was shocked at how fast and far the numbers of returning adult summer chum salmon had fallen.

Looking a little further to the right, I was shocked by how fast and far the numbers of returning adult summer chum salmon had risen.

The story behind it all began to unfold in the late 1970's, when adult summer chum salmon returning to Washington's Hood Canal, actually a glacial fjord, were rapidly declining.

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Quilcene National Fish Hatchery, where from 1992-2004 the U.S. Fish and Wildlife Service propagated threatened Hood Canal summer chum as part of a collaborative effort to rebuild declining runs

Ten years later, in the Strait of Juan de Fuca, the slide in numbers began to mirror that that observed earlier in the Hood Canal.

By 1991, of sixteen summer chum stocks, seven were considered extinct, eight were at a high risk of extinction, and one was at a moderate risk.

With their distinctive "fangs" (earning them the nickname of "dog" salmon) and striking coloration along their sides, they are a particularly interesting and handsome salmon.

Sixty to ninety percent of the fish mature in 4 years, with some at three years and others at five years. After rearing in the northeast Pacific Ocean, they migrate along a southerly route parallel to the coastlines of southeast Alaska and British Columbia.

They begin to enter the Strait of Juan de Fuca the first week of July through September, and appear in Hood Canal from early August through September.

They may mill about the mouth of their natal stream for up to a week and a half, but are sexually-mature upon entry into freshwater. Unlike other salmon species, they exhibit a tendency to school. They also exhibit a greater tendency to stray, possibly owing to a brief freshwater phase as juveniles and a correspondingly shorter time to imprint upon their stream of origin.

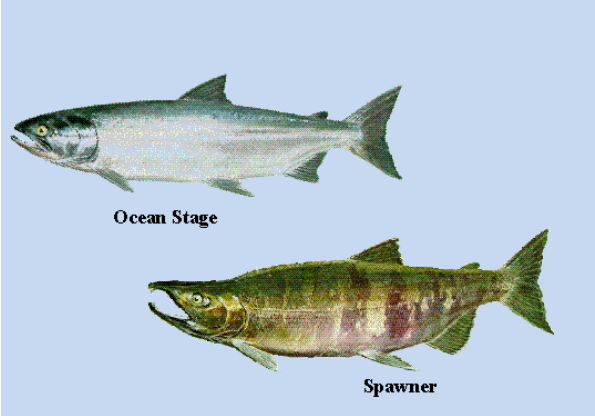
Spawning occurs from late August to late October, generally within a 2 mile stretch of the lowermost portion of the stream.

From February through the last week of May, the fry emerge from the gravel and immediately migrate downstream to the estuary.

The young fish stay extremely close to the surface as well as to the shoreline; when they reach about two inches in length, they begin moving to deeper offshore areas.

Pound-for-pound, chum are regarded as the most powerful of the salmon, and are superb swimmers. But they are poor jumpers and lack tenacity in overcoming obstacles during their upstream spawning migrations; in the Big Quilcene River, 90% of the summer chum spawn in the lowermost mile of the stream.

Summer chum are also unique in their run timing: whereas fall chum return after late autumn rains have swollen and cooled the rivers, the summer chum return when stream flows are at their lowest and water temperatures at their highest levels. Those returning to Hood Canal are even greater daredevils: this area represents the extreme southern fringe of their natural range, and their genetic makeup, when examined, bears this out.



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Adult chum salmon undergo dramatic physiological changes between ocean and freshwater environments.

In March 1999, the National Marine Fisheries Service determined that summer chum originating in the Strait of Juan de Fuca and Hood Canal represented an "Evolutionary Significant Unit" and formally listed the fish as a threatened species.

The Washington Department of Fish and Wildlife and Hood Canal Treaty Tribes share co-management authority of these fish.

In 1992, as an emergency measure, nearly half of the seven hundred summer chum that had returned to the Big Quilcene River were collected to establish a supplementation program at Quilcene National Fish Hatchery. The choice to begin the program during that particular year was something of a stroke of luck: the lower reach of this river was illegally bulldozed in the spring of 1993.

The factors behind the decline of summer chum salmon appeared to stem from a combination of causes:

Not a commercially-valuable species themselves, adult summer chum were being incidentally-caught in coho salmon fisheries, and further to the north, in fisheries directed at sockeye salmon.

Destruction of habitat - and degradation of the remaining habitat – seemed to be a major factor in both the freshwater and estuarine environment. Water withdrawals and measures to prevent the stream from meandering (armoring the stream banks and construction of dikes) and alterations to the channel (removal of large woody debris and dredging) were stacking the deck against the summer chum.

Predation by harbor seals is considered by some to be another potential culprit.

Measures to reduce the levels of harvest on returning adult fish were undertaken, and hatchery supplementation programs were instituted in conjunction with measures to restore and protect habitat.

CREDIT/ Jefferson County Historical Society Research Center

While no longer considered commercially-valuable, Hood Canal chum salmon canneries once distributed these fish to consumers across the nation.

And the fish didn't just languish: run sizes have been building steam since the mid 1990's, with some of the highest returns on record occurring in recent years; in 2004, the number of returning adults approached the 100,000 mark.

Of the six supplementation programs, the largest involved Quilcene National Fish Hatchery. Each year, hatchery staff and employees of the U.S. Fish and Wildlife Service's Western Washington Fish and Wildlife Office combined their efforts to provide broodstock for the hatchery program.

Most of this broodstock originated from Quilcene Bay, captured by tribal fishers using beach seines.

Still others were captured by hand, via snorkeling, within the Big Quilcene River. (Besides taking shelter within root wads and beneath undercut banks, the summer chum also displayed a strong penchant for hiding inside burrow entrances tunneled into the bank by river-dwelling mammals.)

Never intended as a long-term hatchery program, the effort at Quilcene NFH ran twelve years in duration, or three summer chum generations (based on a typical four-year life cycle).

CREDIT/USFWS

Tribal anglers fish the 'Big' Quilcene River. Fisheries restoration efforts by the Service and its partners on Northwest rivers like this one may someday make it possible to de-list Hood Canal Summer Chum.

Additionally, Big Beef Creek – where summer chum had been extinct since 1984 – received inputs of fish that had originated from the Big Quilcene River. The benefit this species, the benefit to the donor stream is that all of its eggs are not literally all in one basket; some of its fish are "in the bank" elsewhere. Thus, the overall extinction risk is reduced for Big Quilcene summer chum.

Non-governmental organizations such as Long Live The Kings and citizen volunteers within Regional Fisheries Enhancement Groups also carried out supplementation programs; in particular, the efforts of the North Olympic Salmon Coalition resulted in the successful introduction of Salmon Creek summer chum into Chimacum Creek and the Hood Canal Salmon Enhancement Group did likewise using fish from the Union River into the Tahuya River.

Today, with habitat on the mend and naturally-produced summer chum returning to streams that had been the beneficiaries of the hatchery supplementation programs, it is already becoming worthwhile to begin to ponder what full recovery and de-listing would actually entail.

And to draw a measure of inspiration from how quickly things can really be turned around when the efforts and talents of multiple agencies and the dedicated people within are combined.